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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/599,594

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Hisashi Akiyama

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EXAMINER

HOFFA, ANGELA MARIE

ART UNIT

PAPER NUMBER

3768

NOTIFICATION DATE

DELIVERY MODE

05/13/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/599,594	Applicant(s) AKIYAMA ET AL.	
	Examiner Angela M. Hoffa	Art Unit 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/4/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to communication filed on January 4, 2007.

Priority

2. It is noted that this application appears to claim subject matter disclosed in prior Application No. PCT/JP05/06941, filed April 8, 2005 and Application No. JP 2004-114713, filed April 8, 2004. Reference to the prior applications must be inserted as the first sentence(s) of the specification of this application or in an application data sheet (37 CFR 1.76), if applicant intends to rely on the filing date of the prior application under 35 U.S.C. 119(e), 120, 121, or 365(c). See 37 CFR 1.78(a). For benefit claims under 35 U.S.C. 120, 121, or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of all nonprovisional applications. Applicant is required to submit the reference in compliance with 37 CFR 1.78(a) by filing an amendment to the first sentence(s) of the specification or an ADS. See MPEP § 201.11.

Information Disclosure Statement

3. The information disclosure statement filed January 4, 2007 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the

Art Unit: 3768

application file, but the information regarding references JP 2002-78710 and JP 2000-23974 has not been considered since copies of the documents were not received.

Claim Objections

4. Claims 1-4 and 6 are objected to because of the following informalities:
- Claim 1, Line 4, "for scanning ultrasonic beam" should be "for scanning an ultrasonic beam"; Line 14, "forming ultrasonic beam" should be "forming the ultrasonic beam"; Line 15, "from ultrasonic echo" should be "from an ultrasonic echo".
 - Claim 2, similar corrections as in Claim 1; in addition, Line 20, "detection means to image data" should be "detection means to the image data"; Line 23, "based on image data" should be "based on the image data".
 - Claim 4, Line 14, "by processing time" should be "by a processing time".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 3 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation presented in both Claims 3 and 6 of “smoothing the information of the oscillation angle” is confusing and unclear. The diagrams in Figures 7-8 provide a clear explanation of smoothing the position detected over time based on the changing oscillation angle. Since the oscillation angle is a function of position, it is not clear what is meant by “smoothing the oscillation angle”. Clarification in the claim language is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2, 4, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,152,294 to *Mochizuki et al.*

Mochizuki et al discloses a three-dimensional ultrasound scanner comprising an ultrasonic transducer unit with ultrasonic transducer elements arranged in an array (array transducer 30, Fig. 2); a transducer unit oscillating motor for making the ultrasonic transducer unit perform oscillation scanning in a perpendicular direction to the scanning direction of the ultrasonic beam (motor 40, Fig. 2); an oscillation angle detection means for detecting an oscillation angle of the ultrasonic transducer unit (angle detector 44, Fig. 2); an ultrasonic transmission means for exciting the ultrasonic transducer element to form the ultrasonic beam (transmitter 104, Fig. 8); an ultrasonic

Art Unit: 3768

receiving means for forming the ultrasonic beam from an ultrasonic echo received by the ultrasonic transducer element (receiver 106, Fig. 8) and converting the ultrasonic beam to visible image data (image processor 110, Fig. 8); an oscillation angle information adding means for adding information of the oscillation angle detected by the oscillation angle detection means to the image data outputted from the ultrasonic receiving means (Col. 7, Lines 25-32); a three-dimensional image processing means for forming a three-dimensional image based on the oscillation angle detected by the oscillation angle detection means and image data outputted from the ultrasonic receiving means (image processor 110, Fig. 8); and an image display means for displaying the three-dimensional image (CRT 112, Fig. 8).

Mochizuki et al further discloses a delay means for delaying position information in the oscillation direction of the ultrasonic transducer unit by a processing time of the scanning conversion means (controller 102, Fig. 8, Col. 7, Lines 8-19) while the images are sequentially reading out the image data from a memory (memory 108, Fig. 8).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 3768

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,152,294 to *Mochizuki et al* in view of U.S. Patent No. 7,457,654 to *Raitzer et al*.

Mochizuki et al does not expressly disclose smoothing the information of the oscillation angle detected by the oscillation angle detection means.

However, *Raitzer et al* discloses a three-dimensional ultrasound imaging system wherein speed versus position information is used to interpolate the angular speed at each frame position where the velocity does not correspond to the exact same position (Col. 8, Lines 34-59).

It would have been obvious to one of ordinary skill in the art at the time of invention to provide a smoothing (i.e. interpolation) function to the oscillation angle information as taught by *Raitzer et al* in order to reduce noise in the data by accounting for non-ideal velocity profiles (Fig. 3 versus Fig. 4, Col. 8, Lines 34-59).

Conclusion

Art Unit: 3768

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Japan Patent No. 2002/078710 to *Watanabe et al* suggests smoothing the oscillation data to account for velocity changes (Abstract) and reads on the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela M. Hoffa whose telephone number is 571-270-7408. The examiner can normally be reached on Monday - Friday, 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. M. H./
Examiner, Art Unit 3768

/Long V Le/
Supervisory Patent Examiner, Art Unit 3768